CLAIMS:

1. A foamed material consisting of a first fluid (K1) forming the matrix, a second fluid (K2) forming the foam bubbles (Z1), and an amphiphilic material (K3), wherein said first fluid (K1) can undergo attractive interaction with at least one first block of the amphiphilic material (K3) facing towards the first fluid, and said second fluid (K2) can undergo attractive interaction with at least one second block (B) of the amphiphilic material (K3) facing towards the second fluid;

   - wherein said first fluid (K1) consists of a material present in a liquid state of matter, preferably in a low-viscosity state;
   - wherein said second fluid (K2) consists of a gaseous material which can be converted to a nearly-critical or supercritical state;
   - wherein said second fluid (K2) is dispersed in said first fluid (K1) to form pools (Po) through attractive interaction with the respectively facing blocks of said amphiphilic material (K3); and
   - wherein the pools (Po) have been transformed to foam bubbles (Z1) in which the second fluid (K2) is contained by changing the state of the second fluid (K2) from the previously adjusted state to the subcritical state.

2. The foamed material according to claim 1, characterized in that said foam bubble density in the first fluid (K1) is from 10^{12} to 10^{18} per cm^3, depending on the mixing ratio between the fluids (K1, K2), the average foam bubble size is smaller than 10 µm, and the total volume of the foam bubbles (Z1) formed in the first fluid (K1) has a volume proportion of from 10 to 99%.

3. The foamed material according to any of the preceding claims, characterized in that said first fluid (K1) is at least one substance selected from the group of polar and/or nearly polar substances.

4. The foamed material according to any of the preceding claims, characterized in that said first fluid (K1) consists of at least one polymerizable substance.

5. The foamed material according to any of the preceding claims, characterized in that said first fluid (K1) consists of a mixture which contains at least one polymerizable substance.

6. The foamed material according to either of claims 4 or 5, characterized in that acrylamide or melamine is employed as monomers of said polymerizable substance.

7. The foamed material according to any of the preceding claims, characterized in that said second fluid (K2) is at least one substance selected from the group of substances consisting of hydrocarbons, alkanols, fluorochlorohydrocarbons and/or CO_2.

8. The foamed material according to any of the preceding claims, characterized in that said amphiphilic material (K3) is at least one substance selected from the group of substances consisting of non-ionic, ionic and amphoteric surfactants, amphiphilic block copolymers, fluorinated surfactants, silicone surfactants and/or co-surfactants.

9. The foamed material according to either of claims 7 or 8, characterized in that water is employed as said first fluid (K1), ethane is employed as said second fluid (K2), and octaethylene glycol monododecyl ether is employed as said amphiphilic material (K3).

10. A process for the preparation of a foamed material using a first fluid (K1) forming the matrix, a second fluid (K2) forming the foam bubbles (Z1) and an amphiphilic material (K3), wherein said first fluid (K1) can undergo attractive interaction with at least one first block of the amphiphilic material (K3) facing towards the first fluid, and said second fluid (K2) can undergo attractive interaction with at least one second block (B) of the amphiphilic material (K3) facing towards the second fluid;

- wherein said first fluid (K1) consists of a material present in a liquid state of matter, preferably in a low-viscosity state;

- wherein said second fluid (K2) consists of a gaseous material which can be converted to a nearly-critical or supercritical state;

comprising the following process steps performed in a reaction chamber:

- said second fluid (K2) is converted by changing its state from the subcritical state to a nearly-critical or supercritical state;

- said second fluid (K2) is dispersed in said first fluid (K1) to form pools (Po) through attractive interaction with the respectively facing blocks of said amphiphilic material (K3); and

- said second fluid (K2) is converted by changing its state from the previously adjusted state to the subcritical state;

- wherein the pools (Po) are transformed to foam bubbles (Z1) in which the second fluid (K2) is contained.

11. The process according to claim 10, characterized in that the process step of converting the density of said second fluid (K2) to a state of liquid-like density consists in converting said second fluid (K2) to a supercritical or nearly critical state and, while in this state, dispersing it in the first fluid (K1).

12. The process according to claim 11, characterized in that the temperature and/or pressure of the second fluid (K2) is raised to a temperature and/or pressure above the critical temperature and/or above the critical pressure of the second fluid (K2).

13. The process according to claim 10, characterized in that the process step of converting the density of said second fluid (K2) to a state of gaseous density

consists in lowering the pressure to a value below the critical pressure and/or lowering the temperature to a value below the critical temperature.

14. The process according to any of claims 10 to 13, characterized in that said dispersing of the second fluid (K2) in said first fluid (K1) is accompanied by a homogenization measure.

15. The process according to any of claims 10 to 14, characterized in that said first fluid (K1) is at least one substance selected from the group of polar and/or nearly polar substances.

16. The process according to any of claims 10 to 15, characterized in that at least one polymerizable substance is employed as said first fluid (K1).

17. The process according to any of claims 10 to 15, characterized in that a mixture which contains at least one polymerizable substance is employed as said first fluid (K1).

18. The process according to either of claims 16 or 17, characterized in that acrylamide or melamine is employed as monomers of said polymerizable substance.

19. The process according to any of claims 16 to 18, characterized in that at least one additive for controlling the polymerization is employed.

20. The process according to any of claims 10 to 19, characterized in that at least one substance selected from the group of substances consisting of hydrocarbons, alkanols, fluorochlorohydrocarbons and/or CO_2 is employed as said second fluid (K2).

21. The process according to any of claims 10 to 20, characterized in that at least one substance selected from the group of substances consisting of non-ionic, ionic and amphoteric surfactants, amphiphilic block copolymers,

fluorinated surfactants, silicone surfactants and/or co-surfactants is employed as said amphiphilic material (K3).

22. The foamed material according to either of claims 20 or 21, characterized in that water is selected as said first fluid (K1), ethane is selected as said second fluid (K2), and octaethylene glycol monododecyl ether is selected as said amphiphilic material (K3).

23. The process according to any of claims 10 to 22, characterized in that at least one additive is employed for controlling the interfacial tension between said first and second fluids.

24. The process according to any of claims 10 to 23, characterized in that at least one additive is employed for controlling the coalescence of bubbles.